# **SECTION 3**

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# RESIDENTIAL UNDERGROUND SERVICE ROUTING FOR REAR LOT DISTRIBUTION

# **NOTES:** (All notes refer to Rear Lot URD routing guide on Page 3-1-9.)

- 1. Where patio type doors or window walls exist, assume that a patio or a deck will be built.
- 2. Trenching cannot be done on an adjacent lot except within the easement where necessary to reach pedestal or transformer.
- **3.** Conduit is required when cable will pass under existing pavement, sidewalks, driveways, etc. When installed, conduit is at the customer's expense.
- 4. Refer to SIM-ESIG Pages 3-3-1 through 3-4-1 for wiring specifications.
- 5. This drawing shows services installed from underground residential distribution but also applies to underground services from overhead distribution.
- 6. When a proposed detached garage is to be on the same side of the lot as the service pedestal, 30 feet of duct is required to protect the cable while the garage is under construction. Install duct 18 inches inside property line. Duct is furnished and installed by DTE Electric at the customer's expense.
- 7. Services shall not be installed diagonally. Install cable 18 inches inside property line (not in easements) parallel to the lot line to a point perpendicular to the meter location.
- 8. DTE may eventually move distribution lines and service points to residences. The acceptable meter location shall be the area along the side of the house (front of the house is acceptable if necessary) nearest the service pedestal and up to 3 feet of the rear of the house. If the building has a driveway, it is preferred to have the meter placed on the opposite side of the house as the driveway. Avoid fenced in areas wherever possible.
- **9.** DTE Electric Planner must approve locations outside the acceptable area. A contribution will include customer furnished and installed duct (with fish line) from the edge of the acceptable area continuous to the meter box, plus a non-refundable contribution for pulling the service cable in the customer-installed duct. Total maximum bending degrees for customer-installed duct is 270. This figure includes the 90-degree bend at the riser.
- **10.** The customer shall have the option of furnishing trench and/or conduit for a new residential service providing that it complies with the above guidelines and with specifications acceptable to DTE Electric Company.

# DTE ELECTRIC COMPANY ASSUMES NO RESPONSIBILITY FOR INJURY OR DAMAGE ARISING FROM THE USE OF THESE SPECIFICATIONS.



# RESIDENTIAL UNDERGROUND SERVICE ROUTING FOR FRONT LOT DISTRIBUTION

**NOTES:** (All notes refer to Front Lot URD routing guide on Page 3-1-11.)

- 1. Required meter height is 3' 6" from center of meter face to final grade.
- 2. The acceptable location for the outdoor meter cabinet shall be the area along the front half of the side of the house nearest the temporary cable marker, the front wall, or 3 feet from the front wall on the side opposite the temporary cable marker. Avoid fenced in areas wherever possible.
- **3.** DTE Electric Planner must approve locations outside the acceptable area. A contribution will include customer furnished and installed duct (with fish line) from the edge of the acceptable area continuous to the meter box, plus a non-refundable contribution for pulling the service cable in the customer-installed duct. Total maximum bending degrees for customer-installed duct is 270. This figure includes the 90-degree bend at the riser.
- 4. Refer to SIM-ESIG Pages 3-3-1 through 3-4-1 for wiring specifications.
- 5. Any bond between the meter enclosure and joint users that interferes with removing the cover on the meter box is a violation of NEC 250.94 (A)(3). The joint user who created the violation must correct it.
- **6.** This drawing shows services installed from underground residential distribution but also applies to underground services from overhead distribution.
- 7. The temporary cable marker is to be removed when the service cable is installed.
- 8. Services shall not be installed diagonally. Install cable 18 inches inside property line (not in easements) parallel to the lot line to a point perpendicular to the meter location.
- **9.** The customer shall have the option of furnishing trench and/or conduit for a new residential service providing that it complies with the above guidelines and with specifications acceptable to DTE Electric Company.

# DTE ELECTRIC COMPANY ASSUMES NO RESPONSIBILITY FOR INJURY OR DAMAGE ARISING FROM THE USE OF THESE SPECIFICATIONS.

**DESIGN PRACTICES** 

SIM-ESIG

**DTE ELECTRIC** 

















# **CUSTOMER CONTRACTOR UNDERGROUND SERVICE INSTALLATION**

# 1. General.

- (a) Prior to the construction of any job, the customer or his authorized representative must consult with the DTE Electric Planner at the appropriate Regional Center to determine acceptable construction standards. Failure to do so could result in added expenses, unnecessary delays, or both.
- (b) This specification covers the installation by the customer's electrical contractor of:
  - (1) Customer furnished, owned, and maintained commercial service conductors.
  - (2) Conduit for DTE Electric furnished, installed, owned, and maintained primary or secondary commercial service conductors.
- (c) A DTE Electric Planner will inspect each installation. All material and workmanship must be acceptable to DTE Electric.
- (d) DTE Electric will install conduit in public thoroughfare.

# 2. Rules and Regulations.

When this specification conflicts with local rules, permission from the inspection authority having jurisdiction may be required. See *Rate Book for Electric Service* Rule C6 for DTE Electric policy.

# 3. Installation of Secondary Cable.

- (a) Only one conductor per leg or phase shall be used for loads of 400 amperes or less when conduit is required in public thoroughfares.
- (b) Not more than two conductors per phase shall be paralleled for loads of 400 to 800 amperes when conduit is required in public thoroughfares.
- (c) For *delta* connection, the power leg and neutral may be reduced in size as allowed by the *National Electrical Code*. For *wye* connection, a full size neutral is advisable to allow for changes in building use such as large single phase loads or discharge lighting; however, the *National Electrical Code* does allow reduction of the neutral on a *wye* service. [See NEC 220.61(B).]
- (d) The conductors shall be of sufficient length to make connection to DTE Electric equipment. (See SIM-ESIG 3-5-15.)
- (e) Maximum number of conductors per conduit is eight, except in network areas, new construction, and modifications where the maximum number of conductors per conduit is four.

- (f) Maximum number of secondary conductors per phase terminating in a padmount transformer will be as follows:
- (g) Maximum conductor size shall be 750 kcmil aluminum or copper.
- (h) Maximum number of conduits per cable pole is three.
- (i) On a cable pole, when paralleling of conductors is permissible, not more than three conductors per phase may be paralleled. A maximum of six conductors may be installed in one conduit. DTE Electric personnel will connect conductors to Company equipment.
- (j) Each conduit shall contain at least one conductor of each phase and one neutral. (Do not install a separate grounding conductor in addition to the neutral.)
- (k) DTE offers a multiple secondary termination cabinet allowing more than 8 sets of conductor terminations. Customer supplies secondary wires to and from cabinet.

# 4. Secondary Cable Termination.

(a) Cabinets and Enclosures. Do *not* use current transformer cabinet or meter enclosure line terminals to connect leads to other CT cabinets or meter enclosures. Use troughs or tap boxes except for the tandem meter assembly shown on page 5-3-6 or for separate space conditioning and water heating rates shown in Section 7. In unusual cases, the DTE Electric Planner may grant an exception.

# (b) Troughs and Tap Boxes.

(1) **Troughs.** Tap connector assemblies with insulated supports or removable insulated covers are required to connect service cables from underground service conductors to meter boxes. These devices may be attached securely to the enclosure or have preformed insulated boots. Individual tap connectors other than split bolts are acceptable. Power distribution blocks or multi-tap connection blocks with insulated boots are preferred.

- (2) Tap boxes. See drawings on pages 3-2-12 to 14 as a guide to this application.
- (3) Customer switches. In those installations where the service conductors terminate in the customer's main disconnect instead of the DTE Electric meter enclosure, the switch must be UL listed for Al-Cu cable termination. See the service equipment assembly drawings in Section 5 for the connecting sequence of main switches and meters. Main switches containing unmetered conductors must be sealable.
- (c) Cable Turning Radius. Adequate wire bending space must be provided within enclosures as specified in NEC Table 312.6(B). Supplementary requirements shown on DTE Electric terminal cabinet drawings must also be met.

# 5. Mechanical Protection of Secondary Cable on Pole.

- (a) Rigid nonmetallic conduit, intermediate metal conduit, or PVC conduit may be used for direct-buried cables. Rigid metal conduit is required in traffic areas. (See paragraph 12 this section and pages 3-4-7 and 3-4-8.)
- (b) Protection provided by the electrical contractor shall extend not less than 8 feet or more than 10 feet above finished grade.

No. of Conductors per	Size of Phase	No. of Customers per Pole	
Phase per Customer	Conductors	One	More than One
1	3/0 AWG through 4/0 AWG	Page 3-4-7 See Note 1	Page 3-4-8 See Note 1
1	3/0 AWG through 750 kcmil	Page 3-4-7	Page 3-4-8
2	4/0 AWG through 750 kcmil	Page 3-4-8	Not permitted
3	N/A	Not permitted	Not permitted

*Notes:* 1. *Minimum size power or neutral conductor allowed with this detail is* 3/0 AWG.

2. Sizes smaller than 500 kcmil should be paralleled only for power or neutral conductors or to add to existing lighters on service increases.

#### 6. Secondary Conductors.

- (a) General. Stranded aluminum or copper conductors that meet *Insulated Cable Engineers Association* (ICEA) standards shown below are acceptable. Cables shall be single conductor with nonmetallic sheath. All conductors, including neutral, shall be insulated with heat and moisture resistant material. Conductors shall be marked in compliance with NEC 310.8, particularly as to insulation type.
- (b) ICEA Specifications. See Power Cables Rated 2000 Volts or Less for the Distribution of Electrical Energy (ANSI/NEMA WC 70/ICEA S-95-658-2021).

# (c) Conductors in Conduit.

- (1) Fed from secondary cable pole.
  - *a.* Acceptable: RHH, RHW, RHW-2--rubber (EPR) or polyethylene (XLP) XHHW, XHHW-2--cross-linked polyethylene
  - *b. Not Acceptable:* TW, THW, THWN, or THHN--thermoplastic (Non sunlight resistant)

#### (2) Fed from transformer or pedestal.

- *a. Recommended:* RHH, RHW, RHW-2--rubber (EPR) or polyethylene (XLP) XHHW, XHHW-2--cross-linked polyethylene
- *b. Acceptable:* TW, THW, THWN, or THHN--thermoplastic (Non sunlight resistant)

#### (3) Fed from network.

Customer shall contact the Service Planner to arrange for the purchase and delivery of AC network service cable.

#### (d) Direct Buried Conductors.

a. Acceptable:

RHH, RHW, RHW-2--cross-linked polyethylene (XLP) USE, USE-2--underground service entrance

# 7. Conduit.

# (a) Acceptable for Cable Protection in Earth.

# (1) Installed without encasement or under concrete drives or buildings.

Rigid galvanized steel Schedule 40 or 80 rigid nonmetallic PVC Intermediate metal conduit (IMC)--hot dip galvanized

# (2) Installed without encasement in open area or under blacktop.

Type II underground plastic duct (styrene) or fiber per NEMA TC-2 Type DB power and communications duct (PVC) per NEMA TC-6 and TC-8

# (3) Installed encased in concrete but *not* under areas subject to vehicular traffic such as concrete drives, aprons, parking areas, etc.

Type I underground plastic duct (styrene) or PVC per NEMA TC-2 Type EB power and communications duct (PVC) per NEMA TC-6 and TC-8

#### (b) Not Acceptable for Cable Protection in Earth.

Rigid aluminum conduit Aluminum or steel electrical metallic tubing (EMT)

#### (c) Conduit Protection at Source.

# (1) Sweeps at primary cable poles.

Rigid galvanized steel Schedule 40 or 80 rigid nonmetallic PVC

#### (2) Sweeps at secondary cable poles.

Rigid galvanized steel Schedule 40 or 80 rigid nonmetallic PVC Intermediate metal conduit (IMC)

# (d) Conduit Protection at Transformer.

#### Sweeps for primary and secondary.

Rigid galvanized steel Schedule 40 or 80 rigid nonmetallic PVC Intermediate metal conduit (IMC)

# (e) Conduit for Single- and Three-Phase Secondary Metered Service.

The customer is usually required to provide two conduits for the primary conductors to the property line on single- and three-phase padmount transformer installations with single meter secondary service. The second conduit provides for later development and extension of fused loop systems.

There will be no charge to existing customers for installing conductors to close loops or to serve new adjacent customers.

The DTE Electric Planner will indicate the route and location of the conduit.

# (f) Conduit Sizes for DTE Electric Cable.

Conduit installed by the customer/contractor for conductors that are to be furnished, installed, owned, and maintained by DTE Electric will be as follows: (See *UG Lines Construction Standards* 1-24-605.)

# **Primary:**

Minimum	4 in #2 Cu & Al
Minimum	5 in 4/0 Cu

# Secondary:

750 kemil Al	3-Wire4 in	750 kemil Cu	4-Wire5 in
350 kcmil Al	4-Wire4 in	750 kemil Cu	3-Wire5 in
350 kcmil Al	3-Wire3 in	500 kcmil Cu	4-Wire5 in
3/0 AWG Al	4-Wire3 in	500 kcmil Cu	3-Wire4 in
3/0 AWG Al	3-Wire2 in	4/0 AWG Cu	3-Wire2-1/2 in

*Note:* Secondary cable duct for service cables owned and maintained by the building owner and furnished and installed by his contractor may use conductor fill and sweep radius that complies with the NEC. For DTE Electric Installation Standards pertaining to these situations see Service Equipment pages 5-4-5 & 5-4-7.

All of the above conduits can be connected to steel or PVC sweeps using adapters to threaded fittings. PVC cannot be cemented to styrene or vice versa. Rigid galvanized steel, intermediate metal conduit, and Schedule 40 or 80 sweeps can be purchased in 18 in, 24 in, 30 in, 36 in, 48 in, 60 in, and 72 in radius ells.

Ninety-degree ell conduit access fittings (types LB, LL, or LR) are not allowed below grade or into the side of meter enclosures; however, with the DTE Electric Planner's permission, they may be used to go through the wall if straight conduit entry cannot be used. The contractor may be required to assist the DTE Electric crew in pulling conduit runs with such fittings when the service conductors are to be installed, owned, and maintained by DTE Electric.

(g) Conduit Marking. Rigid nonmetallic conduit (e.g., PVC) shall be marked per NEC 110-21 and per applicable article (e.g., for PVC see NEC 352.120).

# (h) Service and Commercial Feeder Installation.

- (1) **Trench.** The bottom of the trench should be level without sudden changes that would leave the conduit unsupported during backfill. Backfilling over plastic conduit should be done from the center towards both ends. Trenches for secondary service conductors will be deep enough to assure 24 inches of cover from the top surface of the cable or conduit to finished grade. Trenches for primary conductors will be deep enough to assure 30 inches of cover to grade.
- (2) Plugs and fish line. Conduit must be plugged at both ends immediately after installation to prevent entrance of foreign matter or water. The plugs used must be substantial enough to remain in place. If the conductors are to be furnished and installed by DTE Electric, a stout cord such as nylon fish line will be left in the conduit for the DTE Electric crew to pull in their pulling line.
- (3) Conduit under buildings. Conduit and conductors shall *not* be run under one building to serve another.
- (4) Conduit length. When two-90 degree bends are used to turn conduit up at the building and at the source, the length of the conduit should not exceed 200 feet for secondary and 1000 feet for primary.
- (5) Conduit bends. Bends in addition to those at the building and the source should be avoided. If conditions make bends necessary, the overall length of secondary conduit should be reduced by 5 feet for each 10-degree increment of deflection beyond the two-90 degree bends at the ends. Primary conduit should be reduced by 25 feet for each 10-degree increment of deflection beyond the two-90 degree bends at the ends. Total secondary or primary conduit curvature shall not exceed 270 degrees. Horizontal bends will have a minimum 10-foot radius (use two-45 degree ells with conduit spacer).
- (6) Manholes. A manhole shall be installed when the overall conduit length approaches or exceeds the limits in (4) and (5) above.
- (7) **Public thoroughfare.** The Company will install the duct when an underground service source is located in a public thoroughfare.
- (8) Service termination point. Conduit installed by the contractor for DTE Electric furnished service conductors will terminate at an acceptable multiple service cabinet either on the outside wall of the building or immediately inside. From there, the customer's conductors will continue through or under the building to the service entrance equipment.

- (9) Secondary service pedestal. When the supply is from an underground distribution pedestal in an easement, the use of an all conduit installation is not advisable since conduit cannot be properly terminated at a pedestal.
- (10) Entrance below grade. If the service is designed to enter the building more than 6 inches below grade, careful consideration must be given to the possibility that water may enter the building through or around the conduit. The customer will be responsible for correcting such a condition. (See page 3-2-11.)
- (11) Swimming Pools. Underground wiring shall never be permitted under

swimming pools. A minimum distance of 5 ft. shall exist between any underground supply conductor(s) and the inside wall of the pool in compliance with NEC Article 680.10 and NESC 351(C)(1). Where space limitations prevent wiring from being routed a distance of 5 ft or more from the pool, such wiring shall be permitted where installed in rigid metal conduit, intermediate metal conduit, or a nonmetallic sch 40 pvc.

#### 8. Grounding.

Note: Any bond between the meter enclosure and joint users that interferes with removing the cover on the meter box is a violation of NEC 250.94 (A)(3). The joint user who created the violation must correct the situation.

- (a) **Primary Conduit.** Primary metallic conduit will be grounded at the transformer with a bonding jumper connected between the conduit bushing and the transformer grounding connection. The conduit grounding bushing and the bonding jumper will be furnished and installed by the contractor.
- (b) Metallic Sweeps. Rigid steel or IMC sweeps protecting direct buried conductors, on the end of plastic duct, or on non-continuous conduit will be grounded as above.
- (c) Secondary Conduit. Secondary rigid or intermediate metal conduit that runs continuously to the building will not be grounded at the transformer since it will be grounded at the building per NEC requirements and this would cause a multiple ground path. Current taking an undesirable route on one of these multiple ground paths could cause problems such as conduit heating or tripping of the equipment ground-fault protection (GFPE).
- (d) **Transformers.** Transformer pad ground rod installation and connection are shown on pages 3-6-9 and 3-6-12.

#### 9. Padmount Foundations.

- (a) Specifications. Drawings of concrete padmount foundations for DTE Electric transformers are shown on pages 3-6-1 to 3-6-6.
- (b) Clearances. Transformers must be located with proper clearances as shown on pages 3-7-11 through 3-7-12. The DTE Electric Planner must be consulted regarding pad location *before* construction begins.
- (c) Guard Posts. If the transformer is subject to vehicular traffic, the contractor must install guard posts as shown on page 3-6-10. The DTE Electric Planner must be consulted for the location of these posts.

## **10.** Direct Burial of Conductors.

- (a) Suitable Area. Conductors will be direct buried only in those areas where conditions are suitable, such as open, no traffic locations. *Most commercial services must be in conduit*. Consult the DTE Electric Planner for exceptions.
- (b) **Primary Cable.** Primary commercial service conductors shall be direct buried only when specified by the Planning Area Leader.
- (c) Conductor Location. Underground electric service shall not be installed in the same trench with water pipes or sewer lines. It shall not be installed above anything that is at greater depth such as oil storage tanks or septic tanks. It shall not be installed parallel to recently constructed walls or footings in backfilled earth. It shall not be installed either 12 inches horizontal or 12 inches vertical from a gas line.
- (d) **Trench Depth.** The depth of the trench shall be measured from the existing top surface of ground or final grade, whichever is lower. (Cover is measured from the *top* of the cable or conductor to finished grade.)
- (e) **Trench Characteristics.** A trench carrying direct buried cable should be carefully finished on the bottom, smooth and even without sharp or rough projections that might injure the cable. The bottom of the trench shall be reasonably straight without abrupt changes in depth. Backfill shall be free of rubble and hard or frozen dirt.
- (f) Fill Sand. Well tamped fill sand shall be used as a bed and covering for direct buried cable where soil conditions such as stones, rocks, frozen chunks of earth, or other sharp objects are encountered.
- (g) Joint Use. When a telephone and electric service are in the same trench, the trench shall be a minimum of 4 inches wide and provide a minimum cover of 24 inches for secondary voltages and 30 inches for primary voltages.
- (h) Conduit Required. Conduit shall be used where cable is installed under a permanent surface, such as concrete driveways or walks, unexcavated crawl space under buildings, or under floors. This applies where pavement would have to be removed to repair or replace the cable.
- 11. Cable Location. See page 3-4-11 for service conductor placement on cable poles.
- 12. Cable Pole Risers. When conductors are furnished and installed by the customer, the contractor is responsible for providing mechanical protection for the cable up to 10 feet above grade on the cable pole. The Company will provide mechanical protection for DTE Electric owned and maintained conductors.







DESIGN PRACTICES

SIM-ESIG

DTE ELECTRIC



MAR 24	UNDERGROUND SERVICE	3-4-4	
	TERMINAL ASSEMBLY DTE ELECTRIC LINE CREW	1-9-230	
ALUMINUM BUS BAR 3/8" STEEL STUD MOUNTED TO ALUMINUM BUS BAR	FLAT WASH	HER HEX NUT	
<ul> <li>NOTES:</li> <li>1. MATERIALS ABOVE ARE FURNISHED AND INSTALLED BY DTE ELECTRIC.</li> <li>2. THESE ARE THE ONLY TERMINALS ACCEPTABLE FOR TERMINATING LINE SIDE CONDUCTORS IN THE SINGLE PHASE CL 320 AND CL 200 - 2 POSITION HORIZONTAL ENCLOSURES:</li> <li>FOR 350 KCMIL DTE SERVICES:</li> <li>USE ALUMINUM TERMINAL, IM NO. 100026289</li> <li>FOR 4/0 NEUTRAL USE ALUMINUM TERMINAL IM NO. 100087162</li> <li>FOR 3/0 AWG DTE SERVICES:</li> <li>USE ALUMINUM TERMINAL, IM NO. 100087162</li> <li>FOR 1/0 NEUTRAL USE ALUMINUM TERMINAL IM NO. 100052406</li> </ul>			
DTE ELECTRIC OR DAMAGE ARISI DESIGN PRACTICES	COMPANY ASSUMES NO RESPONSIBIL NG FROM THE USE OF THIS SPECIF SIM-ESIG	ITY FOR INJURY FICATION DIAGRAM. DTE ELECTRIC	







NOV 24	UNDERGROUND SERV	ICE	3-4-6.1	
FIBE USED FOI FARMS	FIBERGLASS PEDESTAL MOUNTED UNDERGROUND SERVICE 200 AMP SINGLE PHASE OR THREE PHASE USED FOR INDIVIDUAL MOBILE HOMES, SEWER LIFT STATIONS, FARMS OR ANY LOCATION THAT REQUIRES A REMOTE METER			
ACCEPTABL 200 AMP S METER ENG AT 200 AM SIM/ESIG S INSTALLED SEE NOTE	E DTE ELECTRIC INGLE POINT LOSURE. RATED IPS LISTED IN ECTION 5-8. BY CUSTOMER. 9.		GRADE	
2" SCHEDI GRADE PV WITH CON REFER TO	ULE 80 ELECTRIC C VERTICAL RISER DUIT CLAMP(S). SIM/ESIG 3-4-1.		30''	
NOTES: 1. NORDIC MPP-141480-MGX METER ENCLOSURE TO INSTALLED BY CUSTOM SPECIFICATIONS.	GROUND PER ARTICLE NEC 250 NOTES: 1. NORDIC MPP-141480-MGX PEDESTAL. BURIED 30" DEEP WITH 50" STANDING ABOVE GRADE. ATTACH 200 AMP METER ENCLOSURE TO PEDESTAL MAINTAINING MINIMUM 3'-6" ABOVE GRADE. PEDESTAL AND METER TO BE INSTALLED BY CUSTOMER. REFER TO SIM/ESIG PAGES 3-4-6 AND 3-14-22 FOR ALTERNATE REMOTE MOUNTING SPECIFICATIONS.			
2. CONDUIT INSTALLED ON CONTINUOUS TO SOUR RATED FOR 200A UG METER ENCLOSURE TO	2. CONDUIT INSTALLED ON OUTSIDE FASTENED TO PEDESTAL WITH A CONDUIT CLAMP(S) (CONDUIT TO BE CONTINUOUS TO SOURCE FEED POINT). USE ONLY DTE ELECTRIC APPROVED SINGLE POSITION METER ENCLOSURE RATED FOR 200A UG LISTED IN SIM/ESIG SECTION 5-8. USE ONLY PRE-MANUFACTURED KNOCKOUT AT BACK OF METER ENCLOSURE TO WIRE TO DISCONNECT.			
3. SERVICE DISCONNECT MUST BE RAINTIGHT. THE DISCONNECT IS SIZED, FURNISHED AND INSTALLED BY CUSTOMER. 4. RIGID AND IMC CONDUIT REQUIRE NON-METALLIC BUSHINGS WITH BONDING PER NEC 250. PVC CONDUIT MUST BE TRIMMED TO REMOVE SHARP EDGES				
5. DTE ELECTRIC INSTALLED UG SERVICES REQUIRE 2" CONDUIT FOR 3/0 SINGLE PHASE SERVICE AND 3" CONDUIT FOR 3/0 THREE PHASE SERVICE.				
6. A SYSTEM GROUNDING ELECTRODE MUST BE INSTALLED IN COMPLIANCE WITH NEC 250.				
7. ADDRESS MUST BE PERMANENTLY MARKED ON METER ENCLOSURE. USE PERMANENT LETTERS OR STICKERS.				
8. THE USE OF THIS PEDESTAL MUST BE APPROVED BY LOCAL BUILDING/ELECTRICAL INSPECTOR.				
9. ANY BOND BETWEEN THE METER ENCLOSURE AND JOINT USERS THAT INTERFERES WITH REMOVING THE COVER ON THE METER BOX IS A VIOLATION OF NEC 250.94 (3). THE JOINT USER WHO CREATED THE VIOLATION MUST CORRECT THE SITUATION.				
10. REFER TO SIM PAGES	10. REFER TO SIM PAGES 5-8-13 THROUGH 5-8-17 FOR APPROVED ELECTRIC METER ENCLOSURES AND ACCESSORIES.			
DTE EL OR DAMAG	DTE ELECTRIC COMPANY ASSUMES NO RESPONSIBILITY FOR INJURY OR DAMAGE ARISING FROM THE USE OF THIS SPECIFICATION DIAGRAM.			
DESIGN PRACTICES	SIM-ESIG		DTE ELECTRIC	










MAR 24	UNDERGROUND SERVICE 3-5-11						
1-9-241 TEMPORARY SERVICE PEDESTAL INSTALLATION WIRE SIZE NO. 8 THRU NO. 2 AWG							
THE SPECIFICATION CONTAINED HEREIN SHALL APPLY ONLY TO TEMPORARY SERVICES							
2 0R 0R 4 3 4" MAX.	1 4'' MAX 12'' 24'' OR 5	FURNISHED AND INSTALLED BY CONTRACTOR 12" GRADE					
SERVICE CONNECTIONS WILL BE MADE TO TRANSFORMER ONLY WHEN NO PEDESTAL EXISTS. LEGEND: 1. DTE ELECTRIC TRANSFORMER 2. DTE ELECTRIC SECONDARY PEDESTAL 3. CONTRACTOR TO FURNISH: A. <u>FOR TRANSFORMER ONLY OPTION</u> - LIQUIDTIGHT FLEXIBLE METAL CONDUIT INSTALLED ON CABLE FROM 12" BELOW GRADE TO THE 2" OPENING IN THE BASE OF THE SECONDARY COMPARTMENT. B. <u>FOR TRANSFORMER ONLY OPTION</u> - A LIQUIDTIGHT FLEXIBLE METAL CONDUIT FITTING WITH REDUCER WASHERS TO FIT A 2" OPENING. C. <u>FOR TRANSFORMER OR PEDESTAL OPTION</u> - 4 FEET OF CABLE BEYOND THE END OF THE LIQUIDTIGHT FLEXIBLE METAL CONDUIT.							
<ol> <li>DIE ELECITIC TO INSTALL AND TERMINATE CUSTOMER'S UG CABLE IN TRANSFORMER OR PEDESTAL.</li> <li>LISTED UG CABLE FURNISHED AND INSTALLED BY CONTRACTOR.</li> <li>CONDUIT FURNISHED AND INSTALLED BY CONTRACTOR.</li> <li>TEMPORARY SERVICE PEDESTAL FURNISHED AND INSTALLED BY CONTRACTOR. SEE PAGE 1-9-242/ SIM-ESIG PAGE 3-5-12 FOR CONSTRUCTION DETAILS. ALTERNATE PRECONSTRUCTION METER MOUNT WHEN APPROVED BY SERVICE PLANNER. SEE PAGE 1-9-225/SIM-ESIG PAGES 3-12-1 THRU 3-12-4.</li> </ol>							
NOTES: A. REFER TO SIM-ESIG PAGE 3-5-15 FOR INFORMATION RELATING TO UG SERVICE. B. LINE CONDUCTORS MAY ENTER METER ENCLOSURE THROUGH BOTTOM OF CABINET. C. LOAD CONDUCTORS MAY LEAVE METER ENCLOSURE THROUGH BOTTOM OR BACK OF CABINET. D. THE ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR LEAVING SUFFICIENT CABLE TO ALLOW 4 FEET INSIDE THE TRANSFORMER OR PEDESTAL. E. TEMPORARY SERVICE PEDESTAL SHOULD NOT BE INSTALLED IN UTILITY EASEMENT. F. ANY BOND BETWEEN THE METER ENCLOSURE AND JOIN USERS THAT INTERFERS WITH REMOVING THE COVER ON THE METER BOX IS A VIOLATION OF NEC 250.94 (3). THE JOINT USER WHO CREATED THE VIOLATION MUST CORRECT THE SITUATION.							
DTE ELECTRIC COMPANY ASSUMES NO RESPONSIBILITY FOR INJURY OR DAMAGE ARISING FROM THE USE OF THIS SPECIFICATION DIAGRAM.							
DESIGN PRACTICES	DTE ELECTRIC						



### **INSTALLATION PROCEDURE FOR SECONDARY METERED SERVICE**

The following instructions are for the customer's contractor in those situations where DTE Electric policy or *Michigan Public Service Commission* (MPSC) rules require customer installation of underground secondary service conductors.

The type and location of distribution equipment is a DTE Electric Planner decision based on the size of the customer's load and the distribution facilities available.

#### 1. Work Around Secondary Power Sources.

- (a) Equipment Access. Only DTE Electric personnel or authorized DTE contractors may open transformers and service pedestals or work above the ten-foot level on DTE Electric poles.
- (b) **Digging in Easements.** In those cases where the customer's contractor is required to install the secondary service conductors to the distribution equipment, the contractor will hand dig in the easement to the customer's property line. The contractor will always notify *Miss Dig* to stake the location of any underground facilities before beginning work. The contractor will not excavate more than 30 inches below grade or do any machine excavating in an easement or within 3 feet of a power source. If the route of the cable must cross another party's property or onto public property, arrangements must be made with the DTE Electric Planner for completion of that portion by DTE Electric crews.
- (c) Adequate Cable Length. The electrical contractor will be responsible for leaving sufficient cable at the source for proper termination by DTE Electric personnel. Specifically, 6 feet of extra cable is required inside a transformer or pedestal and 5 feet beyond the secondary rack on a secondary cable pole. Since the contractor will generally not install the cable into the equipment or all the way up the pole, some judgment will be necessary. In some cases, the DTE Electric Planner may find it necessary to alter these dimensions. In any case, where it is not clear, the contractor should consult with the DTE Electric Planner.

#### 2. Contractor Instructions.

At the source, the contractor will proceed according to one of the following situations:

- (a) Padmount Transformer--Energized.
  - (1) **Direct buried**. Trench to the transformer, hand digging the last three feet, but make no attempt to tunnel underneath. Leave sufficient cable to properly terminate in the transformer.
  - (2) Existing conduit. Arrange for DTE Electric crews to assist in pulling cable into the transformer.
  - (3) Conduit to be installed. Trench and install conduit to within three feet of the transformer. DTE Electric crews will assist in installing the last three feet of conduit, the sweep, and in pulling the cable.

### (b) Padmount Transformer--Not Energized.

The electrical contractor will bring sufficient cable underneath the transformer pad and into the secondary compartment for DTE Electric personnel to properly terminate. The DTE Electric Planner will arrange to unlock the transformer and will be responsible for locking it when the contractor's work is complete.

### (c) Padmount Transformer--Not on Job Site.

The electrical contractor will bring sufficient cable up into the secondary window area of the padmount foundation for DTE Electric personnel to properly terminate.

### (d) Pedestals.

The electrical contractor will trench to the pedestal, hand digging the last three feet, and leave sufficient cable for DTE Electric personnel to properly terminate.

### (e) One or Two Services from a Pole.

The electrical contractor will bring the cable to the pole quadrant designated by the DTE Electric Planner and provide conduit to ten feet above grade. The contractor will leave sufficient cable to reach 5 feet beyond the secondary rack or as directed by the DTE Electric Planner. DTE Electric personnel will train and cover the cable above the ten-foot level and connect to the overhead secondary source. (See page 3-4-7.)

Before instructing an electrical contractor to install service for training up a pole, consideration should be given to possible future services. If it appears that more than two single conductor per phase underground services may be brought to this pole, the DTE Electric Planner should arrange for installation of a pedestal as described below.

### (f) More than Two Services from a Pole.

DTE Electric will furnish and install a secondary connection pedestal in the easement for terminating up to five services. Company personnel will furnish and install the supply cable to the pedestal and connect to the overhead secondary source as shown on page 3-4-5. The electrical contractor will proceed as described in (d) above. The DTE Electric Planner will specify the location of the pedestal as follows:

- (1) The pedestal will be located in the easement on the property of one of the customers requesting service, preferably at the corner of the lot.
- (2) Every effort should be made to avoid installing the pedestal on the same property as the overhead distribution pole.

### (g) Network Underground Cable.

In certain central business district areas, power will be provided from a wye network. (See pages 2-1-5 to 2-1-8 for network maps.) The only service available will be 120/208 V three-wire single-phase or four-wire three-phase. If the lighting demand for the building exceeds 15 kilowatts, a four-wire three-phase service must be installed and the lighting load balanced on all three phases. This will also be true for service to a tenant who is renting or leasing a portion of the building. DTE will extend conduit to the customer's property line from the source. The source may be a manhole or a cable pole. DTE Electric will install the service cable from the source to the service entrance point.

### (h) Rights-of-Way.

In the above situations, Public Utility Easements or Rights-of-Way must be granted before distribution work can begin. Cable routing in easements must follow the Service Routing Guide on pages 3-1-8 to 3-1-10.

## 3. Service Laterals from Underground Distribution.

## (a) Residential.

- (1) Customer requests. The customer, electrical contractor, or developer will arrange for service laterals directly with the Regional Center. (See pages 1-2-1 to 1-2-9 for Regional Center locations.)
- (2) Standard service. DTE will trench and install a standard 3/0 AWG aluminum service from the source, routed as shown in the Service Routing Guide on pages 3-1-8 to 3-1-10.
- (3) Large demands. Larger than normal demands or long runs may require the use of a 350 kcmil aluminum service at additional cost. Consult the DTE Electric Planner. All service conductors furnished by DTE Electric will be sized in accordance with DTE diversity and ampacity tables.
- (b) Commercial.
  - (1) **Conduit required.** Where the area is not suitable for direct burial, the customer's contractor will trench and install ducts for the service laterals. *Most commercial services must be in conduit.* Consult the DTE Electric Planner.
  - (2) Self-contained meters or tap boxes. DTE will furnish, install, own, and maintain appropriately sized laterals to self-contained meter enclosures or secondary connection cabinets. (See *Rate book for electric servcice* Rule C-6.4.)
  - (3) **CT cabinets and switchboards.** The customer will own and maintain, and his electrician will furnish and install services to current transformer cabinets and switchboards. Conductors will be sized in accordance with the NEC.

- 4. Underground Service from Overhead Distribution.
  - (a) Residential. Under MPSC rules, all new, relocated or upgraded residential service connections will be installed as underground residential service lateral at the customer's expense. Therefore, it is necessary for the Company to adapt the overhead distribution system to supply an underground service.
  - (b) Commercial. Underground secondary service laterals may be served directly from overhead distribution if the existing overhead facilities have adequate capacity to serve the additional load. Consult the DTE Electric Planner.





















### Foundation Installation – Excavation, Compacted Fill, Backfilling

These requirements apply to all underground line equipment foundation construction, including box pad, cast in place, and pre-cast foundations.

- A. Excavation Requirements
- (i) Excavation shall be to a depth that will permit preparation of a foundation as specified or installation of the box pad at prescribed depth, but at a minimum, shall be 3'-6" below finished grade. The width and length of the excavated hole shall be sufficient to permit the foundation and compacted fill installation, as specified below.
- (ii) All excavations shall be kept free of standing water, frost, snow, ice, and foreign debris. No foundations shall be set against water, frost, snow, or ice.
- B. Compacted Fill Requirements
- (i) All foundations, including box pad, cast in place, and pre-cast, shall be laid on compacted sand (MDOT Class II fill). Fill shall extend to 3'-6" below finished grade. At the base of the foundation, fill shall extend 1'-0" beyond the plan dimensions of the foundation, on all sides. Fill shall be distributed to 3'-6" below finished grade at a 1:1 ratio. See sketch below.
- (ii) Minimum soil bearing capacity is assumed to be 1000 psf. In cases where adequacy of the base may be doubtful, DTE may require bearing capacity tests results from a qualified testing laboratory.
- (iii)When conditions such as unstable soil, frozen backfill, or rock are encountered, special action must be taken to provide a sound soil base for the entire foundation. The decision for correction of an overall poor condition such as swampy land or general regrading should be made by the division engineer.
- C. Backfilling Requirements
- (i) All foundation excavations shall be backfilled with suitable material and compacted to the final grade as specified. Suitable material shall be lean grout fill (see 3-6-15), MDOT Class II fill (compacted sand), or mineral soil reasonably free of foreign materials, rubbish, debris, etc. Backfill shall be free of frozen clumps, oversized stone, rock or concrete, bituminous chunks or other unsuitable materials that may damage the foundations.
- (ii) Backfill in 9" maximum lifts and compact well. Compaction of backfill materials placed within the foundation openings can be accomplished with portable or hand equipment methods.
- (iii)The top surface shall be restored to match existing elevation and existing construction type.



SECTION VIEW

### Foundation Installation – Excavation, Compacted Fill, Backfilling (Continued)

- D. Installations near existing buildings, structures, or sidewalks:
- i. If the edge of a foundation pad is within 4'-0" of an existing building or structure or within 7'-0" of an existing sidewalk edge, follow this procedure to install base fill near the adjacent foundation/sidewalk.
- ii. Maintain all minimum clearances as noted in Section 11.
- Along the edge adjacent to the building or structure, drive 2x4 or 2x6 wood timbers approximately 1'-1" from the edge of the future foundation pad.
- iv. Timber driving and excavation may be done in stages. It is recommended to maintain the base of wood timbers at least 6" below the base of excavation at all times.
  - a. For example, drive timber down 1'-0" below grade. Excavate 6" of soil. Drive timber another 1'-0". Excavate another 1'-0" of soil. Continue until final depth of excavation is reached.
- v. Base of timbers shall be  $4^{-0}$  below finished grade, minimum.
- vi. Compacted base fill shall be installed as directed. On edges which are not adjacent to existing building or structures, base fill shall be installed as normally specified.
- vii. Install foundation as specified.
- viii. Install grounding rods as specified. Ground rods should be between the wood timbers and the foundation on edges near to existing buildings or structures.
- ix. Wood timbers may be removed prior to final backfill and surrounding grade restoration. Wood timbers may also be left in place, provided they are flush with surrounding grade and do not present a tripping hazard.

# **Foundation Installation – Excavation, Compacted Fill, Backfilling (Continued)**



#### INSTALLATION NEAR EXISTING BUILDING OR STRUCTURE



INSTALLATION NEAR EXISTING SIDEWALK

# Foundation Installation – Concrete Work

These guidelines are intended to be applicable to all cast in place underground line equipment foundation construction.

### A. Concrete Mix Requirements

- (i) Minimum compressive strength of concrete at 28 days: 4500 psi (unless noted otherwise).
- (ii) Use only type I, II, III or IL cement (unless noted otherwise). Contact the DTE civil engineer if types II or III is selected.
- (iii)Provide 5½% +/- 1% entrained air, water cement ratio: 0.45 and a slump of 4" to 6" (unless noted otherwise). Add water reducing admixtures as required to achieve required slump.
- B. Placing and Finishing Concrete
  - (i) Provide a float finish on all horizontal surfaces (unless noted otherwise).
  - (ii) Provide a 3/4" chamfer on all exposed edges of mats.
  - (iii)Place concrete directly against sides of augered excavations. Use sonotube or other approved forms for top 24" of pier (at minimum).
  - (iv)Provide top surface elevations of piers and mats 3" above finished grade (unless noted otherwise).
  - (v) Cold weather concrete placement conform to ACI 306R (latest revision) requirements.
  - (vi)Hot weather concrete placement conform to ACI 305R (latest revision) requirements.
  - (vii) Place all embedded items (such as anchor bolts, pipe sleeves, etc) accurately and secure prior to concrete placement.(viii) Consolidate concrete during placement by use of an adequate number of internal type
  - (viii) Consolidate concrete during placement by use of an adequate number of internal type vibrators.
- C. Curing Concrete
  - (i) Cure all concrete per ACI 308R for a minimum period of (7) seven days.
  - (ii) Keep concrete moist while forms are in place.
  - (iii)Once forms are removed use an approved ASTM C309 Type 2 Class A liquid membrane curing compound at approximately 1 gallon per 150 sq ft of coverage or as specified by manufacturer.
- D. <u>Reinforcing Steel</u>
  - (i) Reinforcing bars, stirrups, and ties shall be ASTM A615 Grade 60 deformed bars.
  - (ii) Provide splices only where shown on drawings with minimum lap length as specified (not less than 12"). If no lap length is given, provide minimum ACI standard lap lengths.
  - (iii)Use black annealed tie-wire,18 ga or heavier wire for fastening. No welding or torch cutting of rebar Is permitted.
  - (iv)Maintain minimum 1<sup>1</sup>/<sub>2</sub>" clearance between reinforcing steel and form ties, inserts, embedments, etc. Maintain 3" steel to soil clearance, and 2" steel to form clearance where not exposed to soil.
- E. Lean Grout Fill

Lean grout fill mixes shall consist of the following (unless noted otherwise):

- (i) 3550lbs of MDOT 2NS (Sect 902.08) fine aggregate per cubic yd.
- (ii) 190 lbs of cement per cubic yd.
- (iii)250lbs +/- of water per cubic yd. Adjust water depending on fill application.















#### PRECONSTRUCTION METER MOUNT

#### 1. General.

As an accommodation to the builder or developer, DTE Electric will allow an underground service to be installed to a preconstruction meter mount fastened to the foundation or basement wall before construction of the building framework. The preconstruction meter mount (PCM) will be the permanent support for the meter on the completed building and should satisfy the following conditions:

- (a) Installation safety.
- (b) Standard service requirements.
- (c) Ease of service installation and maintenance.
- (d) Protection of service conductors and proper operation of metering equipment during and after building construction.

The electrical contractor responsible for the PCM installation must review the plans with the DTE Electric Planner *before* installation begins. The contractor must also comply with the requirements of state or municipal inspectors. DTE Electric offers the following specifications as a guide for PCM installations:

#### 2. Manufactured or Fabricated PCM Assemblies.

- (a) Accepted by System Equipment and Engineering. DTE Electric OH & UG Construction Standards must accept manufactured or fabricated PCM assemblies *before* installation in the DTE Electric service area. (See page 3-12-3 for approved manufacturers.)
- (b) Specifications. Distributors, representatives, or fabricators are required to supply specifications and make a unit available for inspection by the OH & UG Construction Standards Group.
- (c) UL Listed. Power outlet cabinets must have UL labels and have a weatherproof rating (NEMA 3R). Outlets must be GFCI protected.

#### **3.** Meter Enclosures.

DTE Electric allows the 1  $\Phi$  CL 200, 1  $\Phi$  CL 320, or 1  $\Phi$  CL 200 2 position horizontal meter enclosure to be mounted to the PCM. No other meter enclosures or arrangement for connecting the meter will be accepted. Customers are responsible for obtaining and installing enclosures. For a list of approved meter enclosures refer to Section 5-8.

NOTE: Any bond between the meter enclosure and joint users that interferes with removing the cover on the meter box is a violation of NEC 250.94 (A)(3). The joint user who created the violation must correct the situation.

#### 4. PCM Location.

(a) **Properly supported.** The PCM must be located so that a completed wall will support the back of the meter enclosure.

- (b) Acceptable location. The PCM location must be selected and marked with care so that it will not interfere with other tradespersons in the performance of their work. Also, the PCM must not conflict with windows, doors, ledges, dormers, feature details, patios, etc.
- (c) Moving a PCM. In the event that it is necessary to move a PCM after the service has been installed, the customer's contractor must relocate the PCM and a DTE Electric crew must relocate the service conductors. Since moving the PCM will require deenergizing the service lateral, the work of the customer's contractor and the DTE Electric crew must be coordinated.
- (d) **Relocation charges.** The customer will be billed for any work done by DTE Electric to relocate or de-energize the service lateral. In some cases, it may be easier and less expensive to install another PCM at the new location and have the service rerouted to it. The old PCM can then be removed and reused at another job site.

## 5. PCM Installation.

- (a) By Contractor. The customer's contractor installs the PCM. DTE Electric crews will not install or make any corrections to an improperly installed PCM. The installation must be done in a workmanlike manner so that the PCM is solid and plumb.
- (b) Compatible with Building. The PCM must be designed so that it will not have to be moved or modified in any way to complete construction of the wall behind it. The customer must be certain that tradespersons working on the building will not have problems. The various types of wall construction must be taken into consideration.

### 6. Materials.

All support parts for the manufacture of a PCM must be made of solid channel steel (no uni-strut members) and have surface protection that will ensure a long life, particularly those portions in direct contact with the earth where the most severe corrosion can be expected. The thickness of the metal must be such that adequate support and resistance to corrosion will be assured.

### 7. Mounting of Other Equipment.

DTE Electric Planning must accept any equipment that is to be fastened to the PCM assembly temporarily or permanently. Equipment other than DTE Electric devices will not be mounted on the meter enclosure nor depend upon the meter enclosure for support. In particular, any power outlet cabinet intended for use during construction cannot be supported by only a nipple or raceway.

### 8. Temporary Construction Service.

A temporary service power outlet cabinet can be mounted on the PCM assembly providing that it does not depend on the meter enclosure for support. *The person or company installing such temporary service must obtain permission from DTE Electric to break the meter enclosure seal and make connections. If the electric account is closed or the meter is in the disconnect position, application must be made to DTE Electric to install or turn on the electric meter.* The temporary service must be installed in accordance with applicable ordinances and regulations of the governmental inspection authority having jurisdiction and the *National Electrical Code*.

### 9. Grade.

Before calling for service installation, grade on the building site must be established to within 4" of final grade. The service route must be clear of building materials, debris, and other obstructions.

### 10. Inspected by DTE Electric Planning.

The following manufactured or fabricated PCM assemblies have been examined by DTE Electric Planning and are acceptable to DTE Electric as submitted. The purpose of this inspection is to protect DTE Electric's interests. There is no intention on the part of DTE Electric to assume any purchaser's responsibility for the decision to use a particular PCM or to police the quality of the delivered unit. The person buying the PCM must examine the assembly to be sure that the manufacture has followed the material and dimension specifications contained in this section. Any party that decides to construct their own PCM assembly should submit a drawing to DTE Electric at eng\_standards@dteenergy.com for approval before installation to avoid a rejection of the installation.

### 11. Acceptable Preconstruction Meter Mounts.

DTE Electric Planner will approve the installation of PCM based on typical installation specifications (see 3-12-4). If builder needs to purchase a PCM, the following preconstruction meter mounts have been accepted for use in the DTE Electric Service Area. Manufacturers desiring to have their equipment listed may contact DTE Electric at eng standards@dteenergy.com

- (a) Your Electrical Solutions sales@yourelectricalsolutions.net www.yourelectricalsolutions.net Toll Free 855.644.2400
- (c) B&B Electrical PO Box 831 Union Lake, MI 48387 888.391.3802 sales@bbelec.com
- (b) Corby Energy Services 6001 Schooner Drive Belleville, MI 48111 734.547.9237 pcmsales@corbyenergy.com





FEB 24	UNDERGROUND SERVICE	3-13-11
C	ATV POWER SUPPLY INSTALLATI	1-4-8.2 1-9-236
CONNECTION	S WILL BE MADE TO TRANSFORMER ONLY WHEN	(NOTE B)
LEGEND: 1. DIE FLECTRIC PADMOUNT T	RANSFORMER.	
2. DTE ELECTRIC SECONDARY 3. CUSTOMER UNDERGROUND CA 4. CATV POWER SUPPLY.	PEDESTAL. (NOT AVAILABLE FOR FRONT LOT U BLE.	I.R.D.)
NOTES:		
A. SERVICE CABLE		
SPECIFICATIONS: ALUMINUM SINGLE CONE	UCTOR TYPE U.S.E. AND CROSS LINKED POLYE	ETHYLENE RHH-RHW.
RESPONSIBILITIES: CONTRACTOR WILL FURM TRANSFORMER OR PEDES OR PEDESTAL.	ISH AND INSTALL CABLE UP TO BUT NOT IN O TAL, DTE ELECTRIC WILL INSTALL AND TERM	DR UNDER INATE SERVICE IN TRANSFORMER
METHOD OF INSTALLATION: CONTRACTOR WILL CON CABLES. HAND DIG CLO STRIPPING 4'' OF INS ELECTRIC: 8' AT TRAN	ACT MISS DIG WHEN WORKING IN PROXIMITY O SE TO TRANSFORMER, PEDESTAL, OR DISTRIBU ULATION AT END. ALLOW SUFFICIENT CABLE F SFORMER, 4' AT PEDESTAL. SEAL CABLE END	DF DTE ELECTRIC DISTRIBUTION JTION CABLES. IDENTIFY IF FOR CONNECTION BY DTE D AGAINST MOISTURE.
DTE ELECTRIC DET. TRANSFORMER: SIM PEDESTAL: SIM	IL FOR INSTALLATION AND TERMINATION: LAR TO DETAIL 23227E LAR TO DETAIL 23227F	
B. CLEARANCES CATV POWER SUPPLY IS CABLES OR DIRECTLY ELECTRIC FACILITY. PAGE 1-43-72 IN THE	NOT TO BE INSTALLED DIRECTLY OVER DTE E N FRONT OF TRANSFORMER DOOR, NOR WITHIN IF INSTALLED AT SAME TIME AS DTE ELECTR UNDERGROUND LINE CONSTRUCTION STANDARDS	ELECTRIC DISTRIBUTION 2' OF ANY EXISTING DTE IC FACILITIES REFER TO MANUAL.
DTE ELECTRIC ( OR DAMAGE ARISII	OMPANY ASSUMES NO RESPONSIBI NG FROM THE USE OF THIS SPECT	ILITY FOR INJURY IFICATION DIAGRAM.
DESIGN PRACTICES	SIM-ESIG	DTE ELECTRIC

## **MOBILE HOME SERVICE**

### 1. General.

The mobile home park owner is responsible for the selection, purchase, installation, and maintenance of the mobile home pedestal. All installations must meet the following conditions to be installed in the DTE Electric service area:

- (a) Installation safety.
- (b) Sufficient load capability.
- (c) Reasonable life expectancy.
- (d) Ease of maintenance.

The electrical contractor responsible for the pedestal installation must review the plans with the DTE Electric Planner *before* beginning construction. The contractor must also comply with the requirements of the municipal inspection authority. DTE Electric offers the following specifications as a guide to mobile home pedestal installations.

### 2. Load Capability.

The standard DTE Electric 3/0 AWG aluminum underground service lateral will adequately feed a 200-ampere service. The *National Electrical Code* and the Mobile Home Manufacturers Association Standard for Mobile Home Parks both set a minimum standard of 100 amperes for mobile home service equipment. Accordingly, mobile home pedestals must have the capability of supplying 100 amperes, and should be constructed so that the main disconnect can be replaced with one of up to 200 amperes capacity without modification to the pedestal. A number of manufacturers offer units with plug-in interchangeable devices to fit a wide variety of loads.

### **3.** Pedestals and Disconnect Cabinets.

- (a) Accepted by DTE Electric Planner. DTE Electric Planner must accept manufactured or fabricated pedestal assemblies (See page 3-14-19 for acceptable units) *before* installation in the DTE Electric service area.
- (b) Specifications. Distributors, representatives or fabricators are required to supply specifications and make a unit available for inspection by OH & UG Construction Standards Group.
- (c) UL Listed. Pedestal mains or power outlet cabinets must have UL labels and be listed as suitable for use as service equipment. They must comply with the load requirements in paragraph 2 above and have a weatherproof rating (NEMA 3R).
- (d) Interrupting Rating. The short circuit current interrupting rating for the overcurrent device(s) must be a minimum of 10,000 amperes to equal the expected maximum available fault current.

#### 4. Meter Enclosures.

DTE Electric allows the 1  $\Phi$  CL 200 meter enclosure for mounting on the pedestal. Line conductors may enter and load conductors may leave the meter enclosure through the back, providing that the requirements in paragraph 5 are met. The pedestal must be constructed so that an acceptable meter enclosure can be added for interruptible space conditioning or water heating.

→ Note: Any bond between the meter enclosure and joint users that interferes with removing the cover on the meter box is a violation of NEC 250.94 (A)(3). The joint user who created the violation must correct the situation.

#### 5. Pedestal Wiring.

- (a) Conductor Routing. Conductors must be arranged so that their turning radius will comply with NEC Table 312.6(B) and with good wiring practice. Conductors must be aligned with terminals so that pressure is not exerted.
- (b) Service Conduit. Two-inch galvanized rigid steel or Schedule 40 PVC conduit must be provided for the DTE Electric underground service lateral. The edge of the terminal adapter must be covered with a nonmetallic bushing. *Troughs are not permitted*.
- (c) Bonding. Close or chase nipples between components must be 1-1/2 inch minimum size. Metallic components must be bonded to one another using appropriate bonding bushings or bonding locknuts.
- (d) **Supply Cord.** A permanent 4-wire feeder is recommended for connecting the mobile home main panel to the pedestal main disconnect. Alternately, a power outlet cabinet and up to three plug-in cables may be used.
- (e) Conductor Size. Load conductors between the meter enclosure and the pedestal main disconnect will be 3/0 AWG minimum size.

#### 6. Pedestal Location.

The meter enclosure and service disconnect must *not* be mounted on the mobile home; however, the pedestal should be located within 3 feet as shown on page 3-14-20. The pedestal should face away from the side of the mobile home so that a clear space is provided for access to the meter and service equipment. The preferred orientation is with the meter facing the street. *Pedestal must be plumb.* 

#### 7. Mechanical Assembly.

- (a) **Component Mounting.** Pedestal components must be securely fastened using appropriate washers where necessary for solid mounting.
- (b) Support Posts. Support posts must be hot dip galvanized steel. Other means of corrosion protection must be accepted by OH & UG Construction Standards. *Wood is not permitted.*

- (c) Mounting Bolts. Meter enclosure mounting bolts must be long enough so that an extension can be added for interruptible space conditioning or water heating. An extra nut should be provided on each bolt as shown on page 3-14-20.
- (d) Approved Posts. The following support posts will provide a reasonably long life in most soil conditions. Other posts may be used, but must be accepted by OH & UG Construction Standards Group.
  - (1) Rigid steel conduit (2 in) Hot dip galvanized (Intermediate metal conduit or fence post is not acceptable.)
  - (2) Square seamless post (1-3/4 in) 12-gauge min. Hot dip galvanized (*Unistrut Corp.* TELESPAR® Part No. 16F12 or equivalent)

### 8. Grounding.

A ground rod shall be driven at each pedestal location. Material and installation must comply with NEC Article 250.

### 9. Mounting of Other Equipment.

Other utility equipment that is mounted on the pedestal must not interfere with the use of the electrical equipment. (See page 3-14-21) Fastening hardware must not present a hazard to any conductors.

#### 10. Acceptable Pedestals.

DTE Electric Planner will approve the installation of pedestals based on typical installation specifications (see 3-4-6 & 3-4-6.1, and 3-14-20 to 3-14-25). If builder needs to purchase a pedestal, the following pedestals have been accepted for use in the DTE Electric service area. Manufacturers desiring to have their equipment listed may contact DTE Electric at eng\_standards@dteenergy.com

(a)	Adnic Products Co.	(c)	Midwest Electric	(e)	Rollman Electric Co.
	G6261 N. Saginaw Rd.		P.O. Box 910		3351 Consear
	Mt. Morris, MI 48458		Hwy. 22 North		Lambertville, MI 48144
	810.785.2851		Mankato, MN 56002-0910		734.856.1900
			506.345.2505		
(b)	B & B Electrical			(f)	Nordic Fiberglass, Inc.
	Manufacturing	(d)	Power Plus Industries, Inc.		21415 U.S. Hwy 75 NW
	2737 Browning Dr.		16537 Fairway		P.O. Box 27
	Lake Orion, MI 48360		Livonia, MI 48154		Warren, MN 56762
	248.391.3800		734.464.6273		218.745.5095


OR DAMAGE ARISING FROM THE USE OF THIS SPECIFICATION DIAGRAM. DESIGN PRACTICES SIM-ESIG DTE ELECTRIC



FEB 24	UNDERGROUND SERVICE	3-14-22			
POST MOUNTED UNDERGROUND SERVICE 100 TO 200 AMP SINGLE PHASE OR THREE PHASE, USED FOR MOBILE HOME COMMUNITY OR ANY LOCATION THAT REQUIRES A REMOTE METER SEE NOTE 2					
WEATHERPROOF SERVICE DISCONNECT GROUND WIRE	RIGID CONDUIT RIGID CONDUIT METER BOX NOTE 9 METER BOX NOTE 9	SHED SHED SHED SHED SERVICE STREET LIGHTING PERMANENT WIRING SEE NEC 550			
NOTES:		WORKING CLEARANCE IN FRONT OF METER AND SERVICE EQUIPMENT.			
<ol> <li>ALL POST MOUNTED S IS OWNED AND MAIN</li> <li>METER BOX MAY BE: CI 42" MINIMUM HEIGH 6' MAXIMUM TO TOP</li> <li>USE ONLY 2" RIGID THE POST MUST BE</li> <li>SERVICE DISCONNEC FURNISHED AND INS</li> <li>RIGID AND IMC COMI N.E.C. 250. PVC CI</li> <li>DTE ELECTRIC INST/ FOR 3/0 SINGLE PH/ PHASE 3/0 SERVICES</li> <li>A GROUND ROD MUST</li> <li>ADDRESS MUST BE PI PERMANENT LETTERS</li> <li>ANY BOND BETWEEN T REMOVING THE COVER THE JOINT USER WHO</li> </ol>	ERVICE EQUIPMENT, OTHER THAN THE METER BOX AINED BY THE CUSTOMER. 200 FOR 100 TO 200 AMP SINGLE PHASE 200 FOR 100 TO 200 AMP THREE PHASE TO CENTER OF METER FACE FROM GRADE AND OF METER BOX. PIPE POST WITH CAP. WOOD POSTS ARE NOT ALLOWED. NSTALLED PLUMB AND REMAIN PLUMB AT ALL TIMES. MUST BE RAINTIGHT. THE DISCONNECT IS SIZED, ALLED BY CUSTOMER. UIT REQUIRE NONMETALLIC BUSHINGS WITH BONDING PER NDUIT MUST BE TRIMMED TO REMOVE SHARP EDGES. LLED UG SERVICES REQUIRE 2″ CONDUIT SE SERVICE AND 3″ CONDUIT FOR THREE BE INSTALLED IN COMPLIANCE WITH N.E.C. 250. RMANENTLY MARKED ON METER ENCLOSURE. USE OR STICKERS. HE METER ENCLOSURE AND JOINT USERS THAT INTERFERES ON THE METER BOX IS A VIOLATION OF NEC 250.94 (3). CREATED THE VIOLATION MUST CORRECT THE SITUATION.	RENCE PAGE -3-5 -3-18 & 19 WITH			
DTE ELECTRIC COMPANY ASSUMES NO RESPONSIBILITY FOR INJURY OR DAMAGE ARISING FROM THE USE OF THIS SPECIFICATION DIAGRAM.					
DESIGN PRACTICES	SIM-ESIG	DIE ELECTRÍC			



### 1. General.

The Telephone Company is responsible for the selection, purchase, installation, and maintenance of the power pedestal. All installations must meet the following conditions to be installed in the DTE Electric service area:

- (a) Installation safety.
- (b) Sufficient load capability.
- (c) Reasonable life expectancy.
- (d) Ease of maintenance.

The electrical contractor responsible for the pedestal installation must review the plans with the DTE Electric Planner *before* beginning construction. The contractor must also comply with the requirements of the municipal inspection authority. DTE Electric offers the following specifications as a guide for power pedestal installations:

#### 2. Load Capability.

The pedestal must accept the standard DTE Electric 3/0 AWG aluminum underground service lateral and be capable of supplying 200 amperes.

#### 3. Pedestals and Disconnects.

- (a) Accepted by OH & UG Construction Standards. DTE Electric OH & UG Construction Standards must accept manufactured or fabricated pedestal assemblies *before* installation in the DTE Electric service area. (See page 3-14-19 for accepted manufacturers.)
- (b) Specifications. Distributors, representatives or fabricators are required to supply specifications and make a unit available for inspection by OH & UG Construction Standards.
- (c) UL Listed. Pedestal mains and transfer switch cabinets must have UL labels and be listed as suitable for use as service equipment. They must comply with the load requirements in paragraph 2 above and have a weatherproof rating (NEMA 3R).
- (d) Interrupting Rating. The short circuit current interrupting rating for the overcurrent device(s) must be a minimum of 10,000 amperes to equal the expected maximum available fault current.

#### 4. Meter Enclosures.

DTE Electric allows the 1  $\Phi$  CL 200 meter enclosure for mounting on the pedestal. Line conductors may enter and load conductors may leave the meter enclosure through the back, providing the requirements in paragraph 5 are met.

Note: Any bond between the meter enclosure and joint users that interferes with removing the cover on the meter box is a violation of NEC 250.94 (A)(3). The joint user who created the violation must correct the situation.

## 5. Pedestal Wiring.

- (a) **Conductor Routing.** Conductors must be arranged so that their turning radius will comply with NEC Article 312 and with good wiring practice. Conductors must be aligned with terminals so that pressure is not exerted.
- (b) Service Conduit. Two-inch galvanized rigid steel or Schedule 40 PVC conduit must be provided for the DTE Electric underground service lateral. The edge of the terminal adapter must be covered with a nonmetallic bushing. *Troughs are not permitted*.
- (c) **Bonding.** Close or chase nipples between components must be 1-1/2 inch minimum size. Metallic components must be bonded to one another using appropriate bonding bushings or bonding locknuts.

### 6. Mechanical Assembly.

- (a) **Component Mounting.** Pedestal components shall be securely fastened using appropriate washers where necessary for solid mounting.
- (b) Support Posts. Support posts must be hot dip galvanized steel. Other means of corrosion protection must be accepted by DTE Electric Planning. *Wood is not permitted.*
- (c) Hardware. Fasteners used for assembly of components must have adequate mechanical strength to assure dependable service.
- (d) Approved Posts. The following support posts will provide a reasonably long life in most soil conditions. Other posts may be used, but must be accepted by DTE Electric Planning.
  - (1) Rigid steel conduit (2 in) Hot dip galvanized (Intermediate metal conduit or fence post is not acceptable.)
  - (2) Square seamless post (1-3/4 in) 12-gage min. Hot dip galvanized (Unistrut Corp. TELESPAR® Part No. 16F12 or equivalent)

### 7. Grounding.

A ground rod shall be driven at each pedestal location. Material and installation must comply with NEC Article 250.

### 8. Mounting of Other Equipment.

Surge arresters will be connected on the load side of the main overcurrent device and will not be mounted in the meter enclosure.

## 9. Transfer Switch.

If arrangements are made to supply auxiliary power, either on-site or portable, safety precautions are necessary for public and utility personnel protection:

- (a) Double-throw transfer switch must break DTE Electric supply before closing to standby power source. Switch need not be fusible but it must be weatherproof.
- (b) Switch size will be determined by ampere capacity of largest conductor to be connected.
- (c) Switch may control entire load or a portion thereof. Preferably, switch will be on load side of main.
- (d) Switch will be visibly open to DTE Electric supply, although a dead front may have to be removed for this inspection.
- (e) Metering must not be affected by arrangements for supplying auxiliary power. Metered and unmetered conductors will not be intermingled.

MAR	24
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ELECTRICAL DESIGN

3-15-4











# Section 3 SIM-ESIG Sequence List

Section 3	Year	Revision Description
SIM-ESIG		
03-01-08	Mar-24	Edited note 8 to add preference of meter location
03-01-09	Mar-24	Edited acceptable meter location to be along non-drive path side of the house
03-01-10	Mar-24	Updated vellum format
03-01-11	Mar-24	Updated vellum format
03-02-11	Mar-24	Updated vellum format
03-02-12	Mar-24	Updated vellum format
03-02-13	Mar-24	Updated NEC reference
03-02-14	Mar-24	Updated NEC reference
03-02-15	Mar-24	Updated NEC reference
03-02-16	Mar-24	Updated NEC reference
03-02-17	Mar-24	Updated NEC reference
03-02-18	May-24	New Spec
03-03-01	Mar-24	Updated NEC reference
03-03-02	Mar-24	Updated note (f)(3) to encapsulated z-bar and cable size to 350 AWG
03-03-03	Mar-24	Updated table entry for 3 conductors to obsolete
03-03-04	Mar-24	Updated NEC references
03-03-05	Mar-24	Changed NEMA TC-1 to NEMA TC-2 on comment 7(a)(3)
03-03-06	Mar-24	Updated NEC reference and primary minimum conduit size to 5" in note (f)
03-03-07	Mar-24	Updated vellum format
03-03-08	Mar-24	Updated vellum format
03-03-09	Mar-24	Updated vellum format
03-04-01	Mar-24	Added note 12 on the Emergency Disconnect requirement
03-04-3.1	Mar-24	Added note 15 on the Emergency Disconnect requirement
03-04-3.2	Mar-24	Added note 15 on the Emergency Disconnect requirement
03-04-04	Mar-24	Converted ED. No. to IM. No.
03-04-05	Mar-24	Updated vellum format
03-04-5.1	Mar-24	Updated vellum format
03-04-06	Nov-24	Added note 13 on approved meters
03-04-6.1	Nov-24	Added note 10 on approved meters
03-04-07	Mar-24	Updated vellum format
03-04-7.1	Mar-24	Updated vellum format
03-04-08	Mar-24	Updated vellum format
03-04-8.1	Mar-24	Updated vellum format
03-04-09	Mar-24	Page Omitted
03-04-9.1	Mar-24	Page Omitted
03-04-11	Mar-24	Added note on cable colors
03-05-11	Mar-24	Updated vellum format
03-05-12	Mar-24	Updated vellum format
03-05-15	Mar-24	Updated vellum format
03-05-16	Mar-24	Removed Edison verbiage
03-05-17	Mar-24	Updated Rate Book reference
03-05-18	Mar-24	Updated vellum format
03-06-01	Mar-24	Updated vellum format

# Section 3 SIM-ESIG Sequence List

03-06-02	Mar-24	Updated vellum format
03-06-03	Mar-24	Updated vellum format
03-06-04	Mar-24	Updated vellum format
03-06-05	Mar-24	Updated vellum format
03-06-06	Mar-24	Updated vellum format
03-06-09	Mar-24	Updated vellum format
03-06-10	Mar-24	Updated vellum format
03-06-12	Mar-24	Updated vellum format
03-06-13	Mar-24	Updated vellum format
03-06-14	Mar-24	Updated vellum format
03-06-14.1	Mar-24	Updated vellum format
03-06-14.2	Mar-24	Updated vellum format
03-06-15	Mar-24	Updated vellum format
03-07-11	Mar-24	Updated vellum format
03-07-11.1	Mar-24	Updated vellum format
03-07-11.2	Mar-24	Updated vellum format
03-07-11.3	Mar-24	Updated vellum format
03-07-12	Mar-24	Updated vellum format
03-07-13	Mar-24	New Spec
03-07-14	Mar-24	Updated vellum format
03-12-01	Jun-24	Clarified verbiage in section 2 and 3
03-12-02	Mar-24	Updated vellum format
03-12-03	May-24	Updated vellum format, contact information updated
03-12-04	Mar-24	Updated vellum format
03-12-05	May-25	New page for PCM approved meter
03-13-11	Mar-24	Updated vellum format
03-14-17	Mar-24	Updated vellum format
03-14-18	Mar-24	Updated NEC reference
03-14-19	Mar-24	Updated vellum format
03-14-20	Mar-24	Updated vellum format
03-14-21	Mar-24	Updated vellum format
03-14-22	Mar-24	Updated vellum format
03-14-25	Mar-24	Updated vellum format
03-15-1	Mar-24	Updated NEC reference
03-15-2	Mar-24	Updated vellum format
03-15-3	Mar-24	Updated vellum format
03-15-4	Mar-24	Updated vellum format
03-15-5	Mar-24	Updated vellum format
03-15-6	Mar-24	Updated vellum format
03-15-7	Mar-24	Updated vellum format
03-15-8	Mar-24	Updated vellum format